IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Jerrold L. King and
Jerry M. Brooks

Serial No: 09/834,696

Filed: April 12, 2001

For: SEMICONDUCTOR CHIP PACKAGE

Attorney
Docket Number: MICR135.02

Group Art Unit: 2827

Examiner: J. Mitchell

November 11, 2002

Commissioner of Patents and Trademarks
Washington, DC 20231

Sir:

RESPONSE TO THE OFFICE ACTION MAILED SEPTEMBER 12, 2002

Applicants request entry of the following amendment to place the case in condition for allowance.

In The Claims

Substitute the following amended claim for the original claim having the same number.

19.(amended three times) A semiconductor chip package, comprising:

a semiconductor chip;

conductive leads electrically connected to and extending over a surface of the chip;

a continuous body of encapsulating material covering at least a portion of the chip;

electrodes each having a first portion disposed in the encapsulating material and contacting a conductive lead and a second portion protruding from the encapsulating material; and

the body of encapsulating material fully encapsulating the conductive leads except for the point of contact with the electrodes where the encapsulating material is necessarily displaced to allow the electrode to contact the lead.

REMARKS

Claims 19 and 23-24 are pending.

Rejection Under 35 U.S.C. § 112

The Examiner has maintained the Section 112 rejection of Claim 9. Therefore, Applicants seek to amend Claim 19 to recite that the body of encapsulating material fully encapsulates the conductive leads except for the point of contact with the electrodes where the encapsulating material is necessarily displaced to allow the electrode to contact the lead. The proposed amendment does not add new matter and does not require further searching -- as noted in paragraph 9 of the Office Action, Claim 9 was searched and examined assuming the limitation expressly recited in the proposed amendment to Claim 9.

Applicant requests that the Examiner allow the amendment to Claim 9 and withdraw the Section 112 rejection.

Rejection Under 35 U.S.C. § 102

Claim 19 was rejected under Section 102 as being anticipated by the newly cited Ichiyama patent. In support of the rejection, the Examiner asserts, incorrectly we think, that electrodes 8 in Ichiyama are the conductive leads recited in Claim 19.

Claim 19 requires conductive leads electrically connected to and extending over a surface of the chip. In the nomenclature used by Applicants, electrodes 8 in Ichiyama are bond pads, not leads. Ichiyama states that "terminals 13 ... are respectively electrically connected to electrodes 8 of a semiconductor element 1." Ichiyama, column 2, lines 65-67. To the extent this passage and the drawings in Ichiyama do not unambiguously teach that electrodes 8 are bond pads rather than leads, the discussion of the prior art by Ichiyama makes this teaching clear. At column 1, lines 17-19,

Ichiyama states with reference to Fig. 11 that "[e]lectrodes (not shown) on the semiconductor element 1 are connected to inner leads 6 by bonding wires 7." This passage clearly distinguishes between electrodes and leads. In fact, the terminals 13 in Ichiyama replace the leads and eliminate the need for bonding wires. Ichiyama, column 2, lines 13-16.

This distinction is significant for the reasons noted in the Background section of the present application. Ichiyama's semiconductor package is like the chip scale packages discussed in the Background section of the application at page 2, lines 29-34, except that Ichiyama uses a hard conductor terminal instead of solder balls. One disadvantage of this design, in which the external contact is connected directly to contacts on the surface chip, is that the external contacts and the corresponding contacts on a printed circuit board must be reconfigured each time the chip is made smaller. Application, page 3, lines 5-11. This is one of the problems addressed by the claimed invention in which the external contacts are connected to leads that are electrically connected to the chip, rather than external contacts connected directly to bond pads or other such "electrodes" on the chip.

For these reasons, Applicants respectfully submit that the electrodes 8 in Ichiyama cannot reasonably be interpreted to be the leads required in Claim 19.

Rejections Under 35 U.S.C. § 103

Claims 23 and 24 were rejected under Section 103 as being obvious over Ichiyama in combination with Tsukada. Tsukada was published on June 25, 1996 which is after the May 8, 1995 effective filing date of this Application. Tsukada, therefore, is not prior art.

Claims 23 and 24, like Claim 19, require conductive leads electrically connected to the chip. For the reasons noted above for Claim 19, Ichiyama does not teach this element.

Claims 23 and 24 also require solder balls each having a first portion disposed in the encapsulating material and contacting a conductive lead and a second portion protruding from the encapsulating material. The Examiner incorrectly asserts it would be obvious to form the terminals of Ichiyama as solder balls as taught by Tsukada.

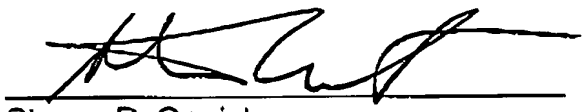
Ichiyama expressly teaches away from using solder balls for terminals 13. Ichiyama, column 1, lines 58-64 and column 3, lines 2-5.

Claim 24 requires a semiconductor chip having bond pads aligned along a surface of the chip, insulating material on the surface of the chip, the insulating material having holes therein to enable electrical connection to the bond pads, and conductive leads attached to the insulating material, each lead electrically connected to and extending over the bond pads. Ishiyama does not teach the insulating material or the leads required by Claim 24 and the Examiner has made no specific assertion to the contrary.

For all of these reasons, the Section 103 rejection should be withdrawn.

The foregoing is believed to be a complete response to the outstanding office action.

Respectfully submitted,



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